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No 55 Dr James

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An
Inaugural Dissertation

Papd March 7. 1829

on

The diseases of the alimentary Canal, in
Children, incident to warm weather,

for the

Degree of Doctor of Medicine

in the

University of Pennsylvania

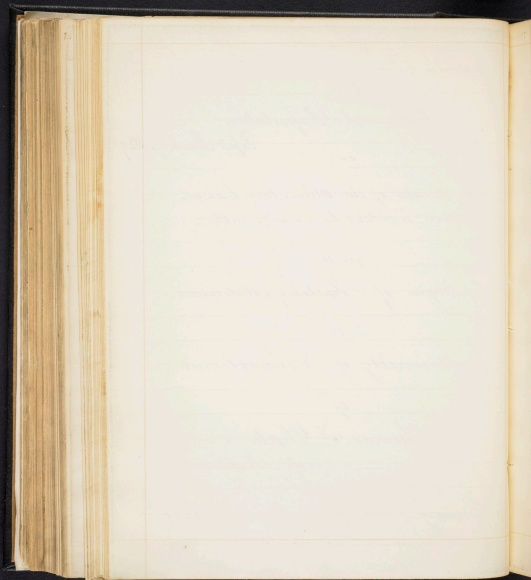
by

Thomas H. Dale

of Delaware

January

1829



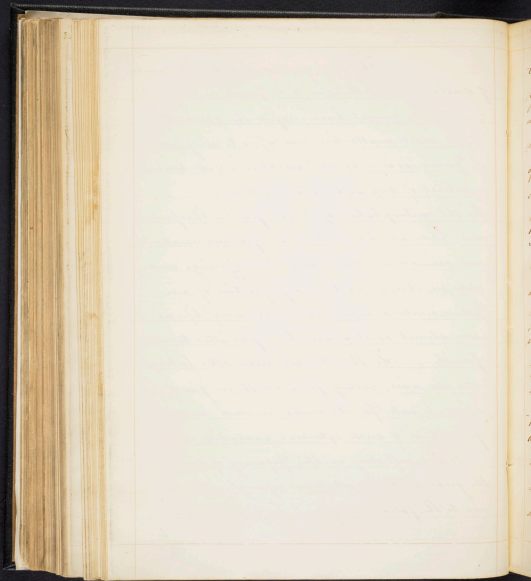
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The very great and distressing number of deaths of young children to be found in every bill of mortality, cannot have escaped the observation of the most inattentive, and offers to every man of feeling as well as the Practitioner of Medicine, a subject of deep and serious interest.

In the contemplation of it, the Philanthropist will have all his kinder sympathies awakened, and cannot but grieve over the sufferings and distresses, that, in so large a proportion of our fellow-creatures, cut short the thread of life, as soon almost as they have been permitted to enter upon it. To the Medical man other feelings will also arise, calling forth all the energies of his mind, to seek for the causes, remedies and preventives of such extensive maladies.

It was reflecting on this frequency of disease and the great mortality attendant upon it, that gave rise to the following essay. In submitting it

to



to the consideration of the Faculty, I am not induced by the hope of adding any thing new on this important and interesting subject; nor shall I, for the sake of rendering this essay more perfect, consult the writings of all such as may have paid most attention to it, and bring, within its narrow limits, their various opinions. But I shall simply present those views I have derived from reasoning & reflection upon that information I may have obtained from attendance on lectures and the course of reading usually pursued by the students of medicine, believing I shall thus best attain the object for which inaugural Essays were instituted.

In attempting therefore to point out some of the causes, principles of treatment and means of preventing the disease of the eliminatory canal in children, I must beg the indulgence of the Faculty to one who, as yet the mere student of the office, is unable & hopes will not be expected to offer any thing derived from the close and accurate observation of experience



at the bed of sickness, from which alone can we
look for advancement in medicine.

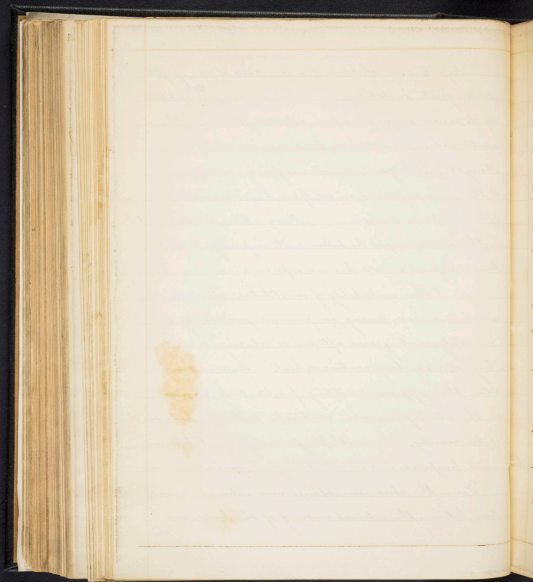
Infants



Infants and children of a few years of age, possess-
-ing greater irritability, (by which, I mean, susceptibility
-ity to receive impressions from external stimuli) than
adults whose constitutions have acquired all their
strength and vigour, must, necessarily, on exposure
to the same injurious causes, from this circumstance,
often take on disease. Many stimuli, which
in the adult, might be taken with impunity, to the
tender infant would become a poison.

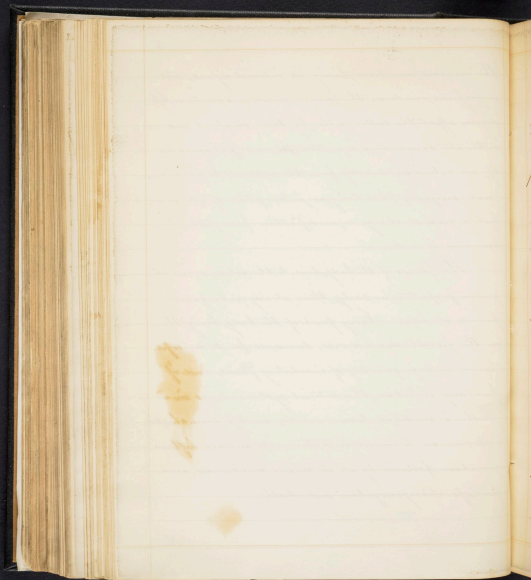
This irritability of constitution must be
much increased, during our summer months, by the
primarily exciting, and afterwards, relaying, debilita-
-ting effects of long continued heat. And in crowded
cities, there appears something particularly noxious
in the atmosphere, when contrasted with the pure air
of the country, where with the same degree of thermomet-
-rical temperature, such effects are not, generally, induced.

From the close resemblance, and intimate connec-
-tion between the external covering of the body, and
the



the mucous membrane lining its internal organs, all impressions made on the former, must, in a greater or less degree, affect the latter, either by their constant and intimate sympathies, or metastasis; and perhaps also by an extension directly from the external to the internal surface: there being no interruption of structure, but a gradual change or modification from skin to mucous membrane.

The fluids of the body, bear to the solids, a much greater proportion in early, than at any subsequent period of life. Every part of the body, being then in the growth and increase, demands, for its development, a large quantity of circulating fluids; and if from any irritation, this arterial system, always in a plethoric condition, become excited, unless soon checked, will run on to convert irritation into intense inflammation followed by all its serious consequences, and perhaps disorganization and death.



The Causes, that produce the summer complaints as they are termed, of children, are various: the vicissitudes of weather, improper clothing, the irritation arising from dentition &c; but the most constant, frequent and prolific cause appears to be great and continued heat.

The effects of this agent are very powerful and manifest on the adults but still more striking when brought to bear upon the tender organs of a child.

Infants, especially, suffer from this cause; for in addition to the heat of the atmosphere, to which we are all subjected, they are almost constantly carried about in the arms of a nurse, pressed to her own heated body.

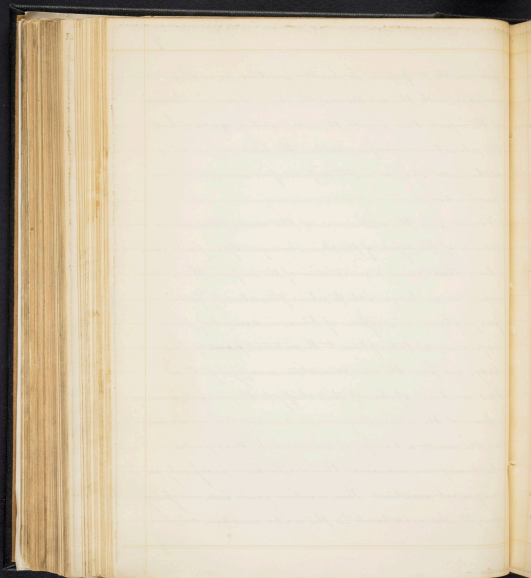
By heat, thus acting on the superficies of the body, the capillary vessels of the skin become very much excited, with which those of other parts, particularly such as are destined to secretion, sympathize, causing an increase, and probably an alteration, of their secretions. But as by a law of the animal economy, a part being for a great length of time, stimulated, becomes fatigued, debilitated

and



and unable to perform its healthy functions, as, in this instance, with the capillaries of the skin. Indeed in the case of the infant, there is with the direct, exciting effects of heat, the relaxation of a vapour bath, — the little sufferer, being continually strained in the vapour of its own and nurse's perspiration.

Hence from the continuance of the cause, there ensues debility of the vessels of the skin, consequently, impaired function; there seems a constriction of the surface, the excited vessels are no longer able to relieve themselves by freedom of perspiration; a reception of blood, on account of these impediments, takes place to the internal parts of the body; and from the close connection and sympathies that we have spoken of, it is chiefly to the mucous membrane of the alimentary canal and secretory organs, and as the result, a transfer of excitement to these parts producing an increased, then debilitated & necessarily an imperfect secretion. These secretions pass into, and issuing from, the stomach & bowels in this excited condition, irritation



of its mucous coat must be the consequence.

Another very common way in which this state of the alimentary canal is produced, is, when the surface is in a state of profuse perspiration, the nurse, either for her own comfort or a mistaken consideration for that of the child, seats it under a cool window, or in a strong draught of cold air; perspiration is suppressed - the blood is driven from the surface to the interior of the body, and produces the same state as described above.

Various other causes also produce or keep up irritation of the alimentary canal, as the irritation arising from dentition, by extending from the mucous lining of the mouth to that of the stomach & bowels; - an accumulation of faeces in the ^{more than any other type of Stooling} intestines; indigestible food, in short, in mucous membranes, the slightest irritant produces an increase and alteration of its secretions.

In this changed state of the alimentary canal, there are not wanting numerous causes to keep up and increase irritation. The very condition itself, causing as we have said, a change in
 H.

The first of these is the
 fact that the system is
 not self-sufficient. It
 requires a constant supply
 of raw materials and
 labor. The second is
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the quantity and quality of the secretions, acts, in this stage, a constipating state of the bowels, and indeed almost every kind of ingesta then become irritants or morbid agents - some, of course, more than others, from their quality - particularly the great quantity of fruits consumed at this season and that too often subripes, much of which are very indigestible, and thus are productive of very great harm, acting as foreign bodies and highly sensible and irritated surfaces; they are also injurious in another way, from the great quantity of acids they contain or generate in the stomach, and when this exists, common and otherwise healthy food, even the most delicate, will become a source of disease.

According to the particular seat and intensity of this irritation, produced in the manner I have endeavored to show, will be the form and violence of the disease.

If seated principally in the Stomach, we have manifested all the symptoms of irritation of this organ, nausea, vomiting, great, early, and disinclination to food, depression and as the brain and circulatory system sympathize, fever.

head ache



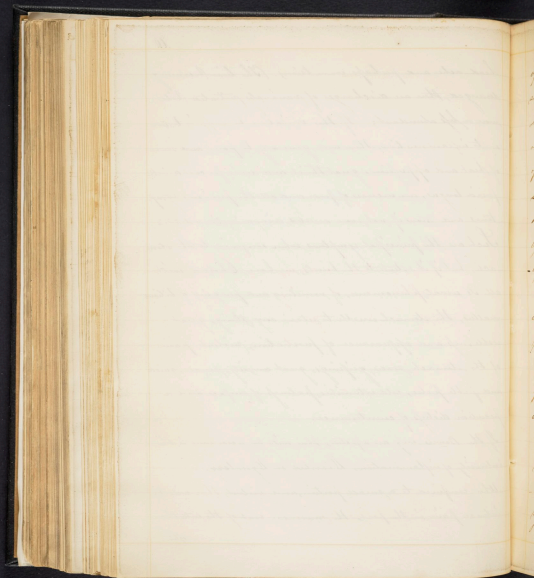
head-ache and perhaps convulsions. (The liver becoming
 deranged, there are discharges of purulent matter, bile,
 more or less abundant; If this irritation be sufficient to
 excite inflammation, there will, generally, be pain, and sense
 of heat and oppression, great thirst and desire for cool drinks
 firm tongue, an increase of fever and all the previous symp-
 toms and now if not soon arrested, disorganization & death.

Such are the principal symptoms when confined to the stom-
 ach, but if it extends to the bowels, we have, Cholera, with
 all its usual phenomena, of vomiting and purging of bilious
 matter, the stomach unable to retain any thing, great
 restlessness and appearance of prostration, violent pain
 of the stomach, severe gripings, great anxiety, small, quick
 and feeble pulse, cold extremities, paleness of surface and a
 peculiar dishevel of countenance.

If the Bowels only are affected, there will be, according to the
 intensity of inflammation, Diarrhea or Dysentery.

When confined to a small portion, and violent, there will be
 intense pain in the part, the muscular coat of the intestine

often



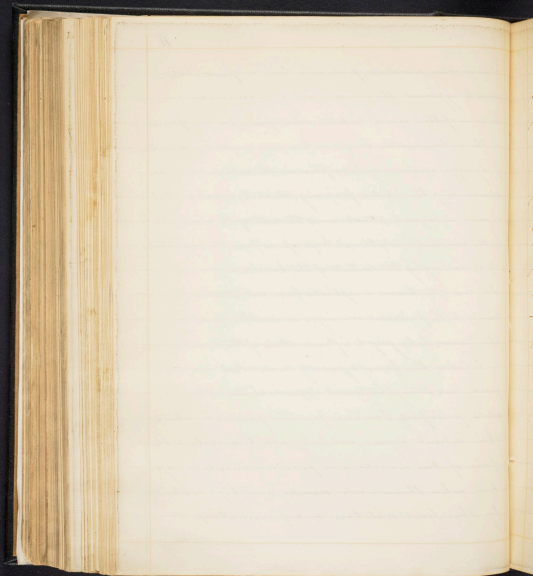
often becomes involved, producing Colic or spasm, which serves to aggravate the already existing inflammation:

In some of these cases of enteritis where spasm has been present or the inflammation confined to a small extent, a disposition of lymph occasionally takes place in the cellular membrane surrounding the intestine, producing stricture, which in this or some subsequent attack causes the death of the child, either by the constant irritation it keeps up or from the impossibility of discharging the contents of the bowels.

The case often becomes complicated from an extension of the disease to the peritoneal covering, and we then find the phenomena belonging to inflammation of this membrane.

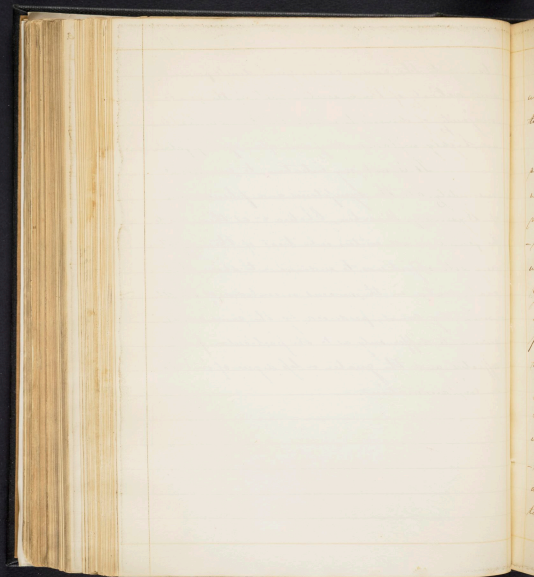
Each of these forms is generally more violent and more quickly runs through its several stages in children than in adults, principally, I conceive, from their plethoric constitution, their delicate organs not being able to withstand the force of this energetic and powerful circulatory system, when thrown into disorder and high excitement by their local irritations or inflammations.

owing



Owing to the same cause, great development and activity of the vascular system, the great majority of diseases to which children are liable, are highly inflammatory and often speedily fatal.

It is not my intention, to enumerate minutely, all the symptoms and phenomena of Dysentery, Diarrhea, Cholera &c; as these are to be found in all writers who treat of these affections, my sole object was, to endeavour to show, that each, seated in the mucous membrane of the alimentary canal, produced by the same causes, seemed to differ only as to the particular part affected, and the greater or less degree of irritation or inflammation.

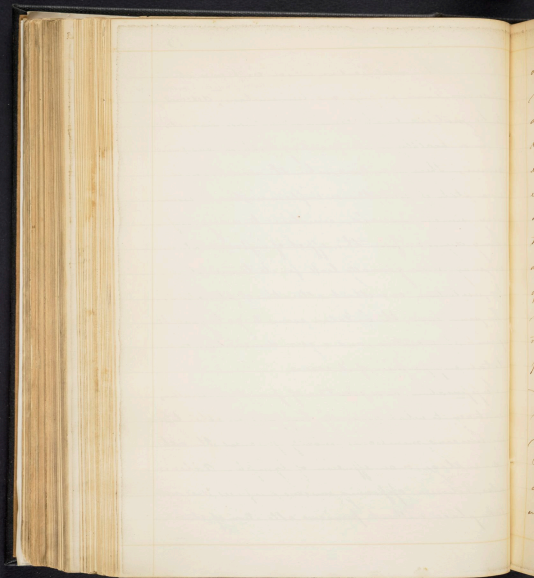


The modification, which inflammation
 undergoes, in its progress and termination, ^{when situated, mucous membrane} deserves
 to be noticed in the consideration of my subject.

In a healthy state secreting both mucus and
 serum, these secretions, when the membrane is
 in a state of irritation or inflammation, become
 very much increased, - sometimes to a very surpris-
 -ing degree: From this effect of inflammation,
 we may more generally look for its terminating
 by resolution, or without alteration of structure.

In some cases, the irritation seems to go beyond the
 point of secretion, and a great diminution or a
 total suppression of it occurs.

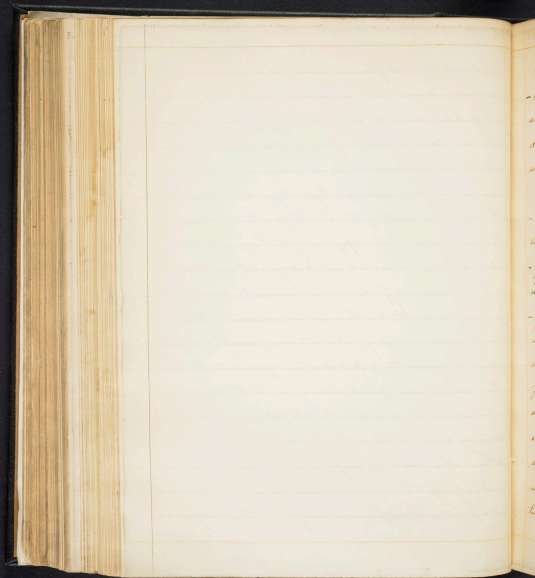
Suppuration, or a secretion of purulent matter,
 contrary to what generally happens in other tissues,
 in mucous membranes mostly precedes the adhe-
 -sive stage, or an effusion of lymph. Adhesion
 also, between opposing mucous surfaces, does not
 take place without previous alteration of structure



or ulceration. Inflammation, when seated in mucous membranes, is not so liable to spread along the course of the same tissue, by what is termed, continuous inflammation, but rather to extend to adjacent tissues, as is seen in post mortem examinations in cases of dysentery, where ulceration of the different coats of the intestines, often exists, without the inflammation appearing to have extended far along the mucous coat. A very striking example of this fact is afforded in inflammations of the lining membrane of the urethra, which seldom extends to the bladder, or any great distance from the original point of irritation; but it often spreads to the cellular membrane surrounding it, to the corpus spongiosum and even to the skin, which in many cases become highly inflamed.

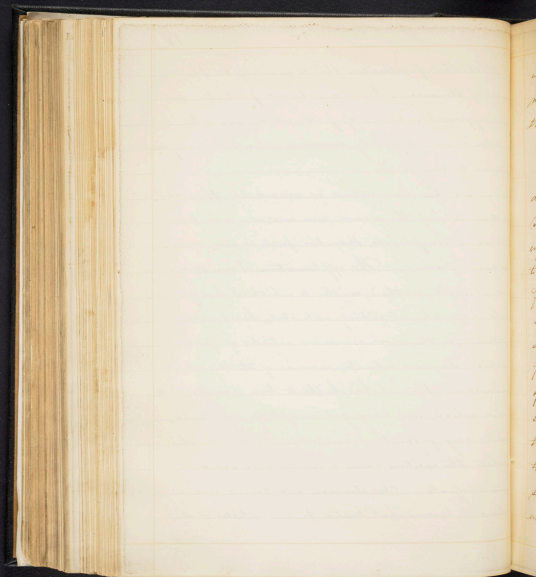
From this want of disposition to spread itself, the activity of the inflammation being all expended in a point, ulceration is very apt to be the consequence,

with



With these peculiarities, there is generally in the dis-
 -ses of the mucous tissue, a feeling of prostration and
 an apparent feebleness of pulse, which, has often
 deterred from depleting measures, when other symptoms
 seemed to call for it,

It has been noticed as remarkable, that chil-
 -dren, during the second summer, are more liable
 to these complaints, than the first or ~~very~~ sub-
 -sequent seasons. The explanation I would offer
 is, that the mother's milk, to which it had previous-
 -ly been almost entirely restricted, has been laid
 aside for the more common articles of food,
 which demand a greater exercise of the digestive
 function than it has hitherto been accustomed to,
 and which, not being yet completely established,
 will very frequently become deranged, and in this
 state the existing causes of disease will act with
 more effect. The stomach and bowels require
 time to become habituated to new articles of diet



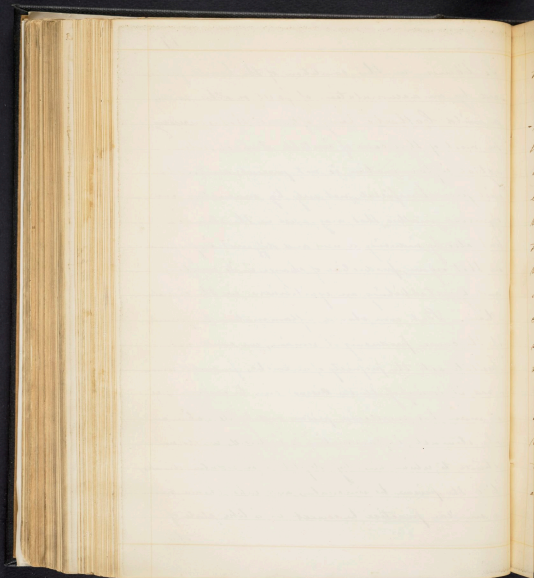
in order properly and readily to digest them, as man to become reconciled to, and content with, the various changes in life.

Treatment. The indications of cure, to be deduced from the view I have taken, are obvious, viz., To remove the cause; to allay irritation, or subdue inflammation, and promote healthy secretions, and to restore the vessels of the skin to their healthy function.

If the original cause of the irritation continue to act, it must if possible be removed: hence the propriety of a mild Emetic, to relieve the stomach of indigestible or other irritating ingesta, when from the history of the case and symptoms we infer their presence. I allude here to the early stage, when there is simple irritation caused and kept up by such articles; their removal, will often put an end to all unpleasant symptoms,

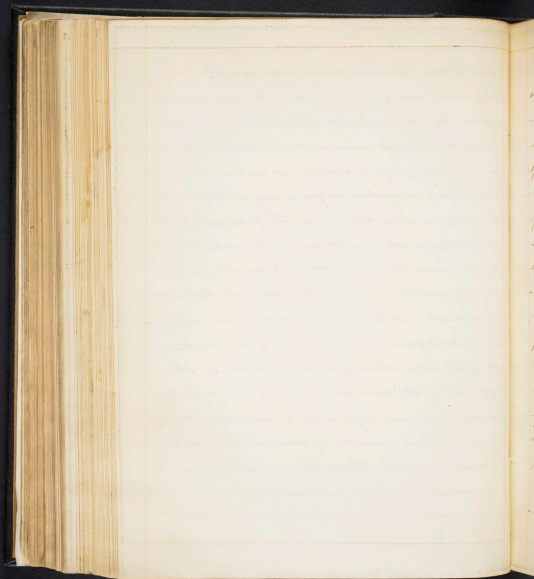


So likewise in this condition of the bowels, produ-
 ced by an accumulation of faeces or other solids,
 a mild Cathartic being often all that is necessary.
 In most of these cases of irritable stomach, where
 actual inflammation is not present, an Emetic
 will prove beneficial, not only by evacuating any
 offensive matters that may exist in the stomach,
 but also by inducing a new and different impression
 on that organ, productive of change in its secretions,
 and by establishing an equilibrium in the circula-
 -tion. But even should inflammation be present,
 if the cause producing it remain, we could not
 hesitate as to the propriety of an Emetic, for until remo-
 -ved, it is impossible the disease can be overcome; if
 a man has swallowed poison and by its action on
 the stomach, inflammation is induced, we do not
 struggle to relieve him by depletion or sedative drinks,
 'till the poison be evacuated, and why should not
 a similar practice be correct in a like state of
 this



this organ, induced by any other agent?

In some cases of very irritable stomach, accompanied by constant and violent retchings, all the usual remedies addressed to the stomach alone, with a view to its relief, by quieting and rendering it tranquil, either fail altogether, or prove only of temporary benefit; in a few hours, or on the following day, the retchings return with as much violence as before, even though nothing is discharged from, or appears to remain on, the stomach, that would cause such distress. This state, in some instances, seems to depend on constipation of the bowels, or the presence in them of irritative secretions; the affection of the stomach being only sympathetic or secondary and dependant on irritation of the bowels; which condition of stomach will continue till the bowels be thoroughly evacuated, when often all distress of stomach subsides.



If the stomach and bowels are both affected, constituting what is called Cholera, being assured that the immediately exciting cause is no longer present, we must first endeavour to tranquilize the stomach by small doses of Laudanum, Mental quietude, very minute doses of Calomel, cold, aculeous drinks, as Lemonade, & finally by fomentations over the Epigastrium. Thinking Lemonade, I have known relieve a severe attack of Cholera in two instances. If the stomach be so irritable as to preclude the administration of remedies by the mouth, we must resort to Enemas, throwing up the rectum, a portion of Laudanum, cold, mucilaginous, cold water &c. The Warm Bath is often of very great service in these cases, by inviting the blood to the exterior of the body, it equalizes the circulation, relaxes the skin and calms the whole system. Hot Applications, are beneficial on a similar principle.

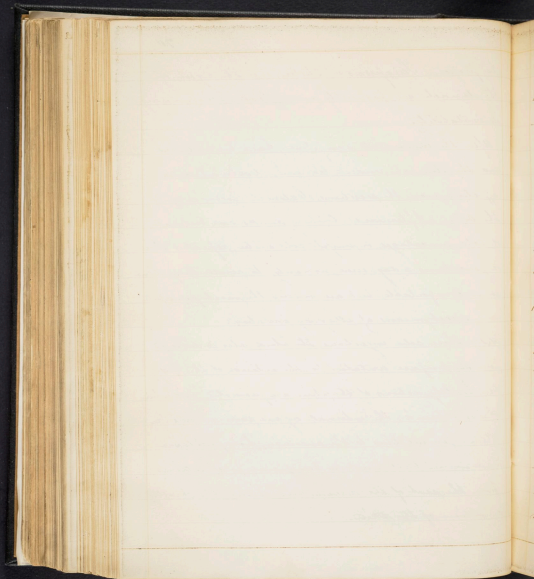
Should all these means fail, a mild emetic of Spess-um, given with the pills mentioned above, would



be proper. *Laxatives* & *Purgatives* over the region of the stomach are frequently very efficacious in removing its irritability.

After the immediate symptoms have been relieved, and the stomach rendered tranquil, *Caster oil*, or as affecting more the peritons, *Calomel* follows up by the oil. Afterwards, *Cooling drinks*, and *Enemata* of cold mucilages, or simple cold water, repeated three or four times a day, serve not only, to render the patient more comfortable, but are among the most powerful and direct means of allaying irritation.

By these cold injections, the blood also is diverted from the surface irritated to the exterior of the body, the healthy actions of the skin are promoted, and when this is obtained, the internal organs soon are relieved. Warm fomentations to the abdomen, hot pediluvia and warm bath are very beneficial as sometimes from the seat of the disease, and restore the healthy condition of the skin.



In *Rhinorhoea* and *Oxyenteris*, in which there is often active inflammation, and having few mixed, few spreading, in mucous tissues, this runs on to ulceration, we are called upon to use prompt and active measures to arrest it.

Now when there is much fever & pain, General, as well as Topical Bleeding will be demanded. We cannot, I think, hesitate to employ those remedies, when we remember, as stated in the commencement of this essay, that it was owing to the very phlebotomic condition of children, in a great degree, that their diseases were so violent and so frequently fatal. It is by removing or lessening this phlebotomy, that we relieve the system of its oppressive load and enable the recuperative energies, so strongly displayed in children, to exert their power.

When the disease has continued for some time and the patient has become debilitated by profuse discharge and long sufferings, General bleeding might, and very often will, be improper, but local depletion may frequently be employed with much advantage.

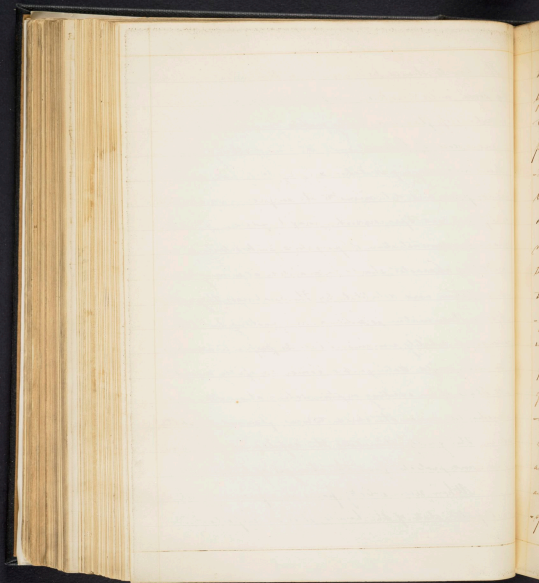
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The bowels should be evacuated of their irritative contents by some mild laxative, and then the cold mucilaginous injections of flax seed, barley water, gum water &c.

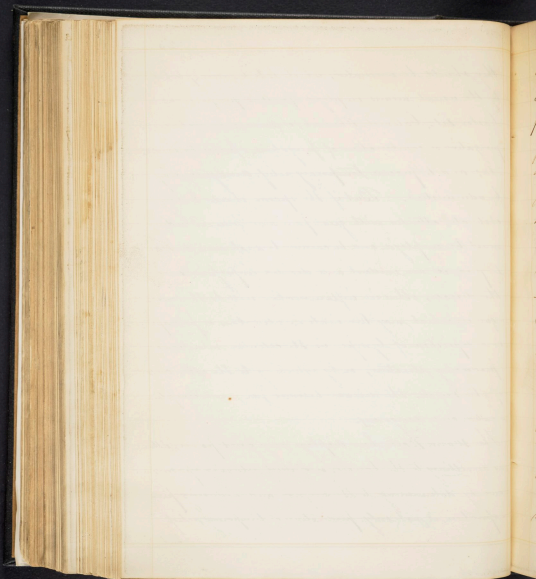
Small doses of Colomet, with the view of altering the secretions, and exciting irritation, are very beneficial; and to relieve pain and determine to the surface, a small portion of Opium and Spasmodica may be added. But the frequent administration of Purgatives, particularly of an irritating character, should be avoided, as tending to keep up irritation and debilitate by the discharges, they excite. After inflammation is subdued and nothing but the consequent debility remains, it will be proper to administer some mild astringent or Tonic, carefully avoiding all those of an exciting or stimulating character, and we should cause the child to wear Flannel next the skin, this gently stimulates the capillaries of the surface and protects from the changes of temperature.

When severe colicky pains are experienced, with a constipated state of the bowels, it is all important, that
 They



they should be evacuated; which is to be accomplished by the usual means employed for that purpose, as Castor oil, Calomel, Rhubarb, or some more active purgative or combination of purgatives, assisted by enemata; and to procure temporary relief, anodynes may be administered. But if the spasm should be very obstinate, attended with great pain and fever, Bleeding must be employed, and be carried to such an extent as to produce an evident and decided improvement in the disease, otherwise inflammation will be the consequence, which may terminate in ulceration, or perhaps in a deposition of lymph in the cellular membrane producing stricture, or by extending to the other coats of the vessels, the disease becomes far more complicated and dangerous.

The Warm Bath here displays very great power, either as auxiliary to the lancet, or of itself relaxing spasms; and by determining to the surface and inducing perspiration, is not only productive of temporary relief but



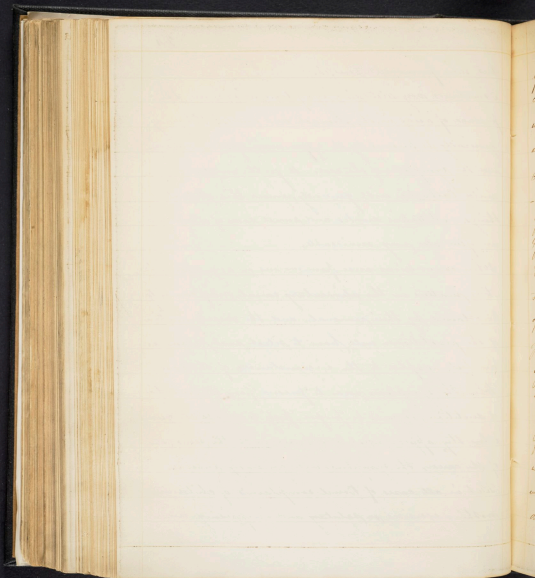
but more permanent benefit.

Sometimes very distressing symptoms arise from the presence of acids in the stomach and bowels; this may generally be known by the appearance of the discharges and the symptoms of the case. A gentle Emetic or mild Cathartic will generally remove this state of things. Alkaline drinks and small doses of ellagresia are often also very serviceable.

When convulsions arise from worms or any other irritating matters in the alimentary canal, relief can only be obtained by their removal, and the discrimination of the practitioner will have to select such means as are best adapted to the circumstances of the case.

When the symptoms seem to proceed from the irritation of dentition, it will be proper, first to divide the gums where they appear most tense; and with the removal of the cause, the symptoms will generally subside.

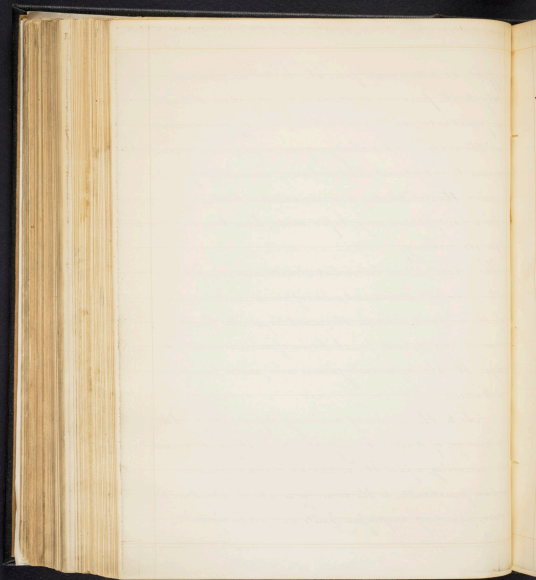
But in all cases of Bowel complaints of children, nothing exercises so salutary and surprising an effect



effect, as a removal from the heated and crowded city to the pure air of the country. Or where this is impracticable, short rides into the country or excursions on the water. This change of air, in some instances, seems to act almost like a charm, immediately removing the debilitated and emaciated little sufferers, for whom scarce any hopes could have been entertained for its recovery.

The diet, must be consistent with, and made to aid, the medical treatment and of course will consist of the mildest articles: the mother's milk for the young infants, and for children of more advanced age, the Munda mucilaginous and mild farinaceous articles.

As to the means of avoiding or preventing this frequency of disease among children, they will consist in removing, upon the setting in of warm weather, where practicable, to the country - strict attention to diet, avoiding improper fruits and all indigestible
irritating



irritating food - preventing Fatigue, or too great exposure to the heat of the sun, - covering flannel next the skin - protecting the feet from cold and dampness - and in infants, that they should never, if possible to prevent it, be weaned within the year - The daily use of the Cold Bath, under proper regulations will often prove advantageous.

Throughout this essay, I have, no where entered minutely ^{into the subject,} I have endeavored to show how these diseases of children were produced, in what they consist, glanced only at their more prominent symptoms, and for going painting out minutely their treatment, I have only alluded to the general principles upon which their management was to be conducted. To have gone as fully into the subject as its importance demands, would, not only, have required one more experienced than myself, but have extended far beyond the limits of an Inaugural Dissertation.

J. H. Hale



No 106

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25 Market.

Sept 8th. 1828

Proclamation

Proclamation

The State of New York

The University of the State of New York

Charles C. Smith

John C. Smith

January 4th

1828

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